Vol. XIX. MARCH 1935. No. 3

CONTENTS.

No. PAGE.

1. Notes on some birds seen at Nedungayam Camp, 1934. — By, *P. W. Davis, I. F. S.* ... 135

2. The Forests of Southern India. — By, *A. Wimbush, I. F. S.* ... 138

3. An encounter with a python. — By, *S. Sundravarada Chariar, M. R. H.* ... 150

4. College Notes 155

5. Extracts : 159

Fireproofing processes (159). Indian laurel (161). Toads save crop (163). Breeding habits of hornbills (163). Invert sugar from the Cashew "apple" (164). Imperial botanical conference, 1935 (165). Digestion of wood by insects (165). Cold weather planting in Northern India (166). Wedding gift to the Duke of Kent (166). Forestry in India (167). Seven rogue elephants shot in six months (171). Malaria in Ceylon (172). Government review on Forest Administration Report, Madras, 1933–34 (174). All India Conference for the Preservation of Wild-life (176).

6. Notifications relating to Rangers... ... 177

Managing Committee.

P. W. DAVIS, B.A., I.F.S.,
(President.)

Rao Sahib V. N. SESHAGIRI RAO, B.A.,
(Business Superintendent.)

G. VISWANATHAM, B.A.,
(Editor & Treasurer.)

C. P. BHIMAYYA, B.A.,
N. SRIDHARAN PILLAI, B.A.,
(Assistant Editors.)

THE

Madras Forest College Magazine.

(PUBLISHED QUARTERLY).

Vol. XIX. MARCH 1935. No. 3

The Managing Committee do not hold themselves responsible for opinions expressed by contributors.

Notes on some birds seen at Nedungayam Camp, 1934.

By, P. W. Davis, I. F. S.

The least observant could hardly fail to take some note of the bird life around this camp as the river banks and the open forest just here accommodate an unusually large variety of species, and the swamp close by holds its own community. The birds named below are only the commonest, which were recognisable without the aid of glasses, although for a close study of bird habits a light telescope or field glasses are desirable.

The colony of swifts seen in November 1934 attracted some attention again this year both by their numbers and by their remarkable powers of flight. They frequented the reach of river just below the bridge, beating to and fro with great rapidity in the late afternoons, the "swishing" beat of their wings being audible even at some distance. They were too rapid on the wing for their plumage to be clearly noticed, but from the description given by Baker and Inglis in "Birds of Southern India" it is probable that they were the Indian Crested Swift (*Hemiprocne*

Coronata) the more particularly as their characteristic habit of dipping to the surface of the water, shimming it and rising again is noted by Jerdon for this species. Their numbers became fewer in December.

Noticeable amongst the company of river birds was the Pied kingfisher (whose more pretentious name is *Cerylerudis leucomelanura*) a very common bird with characteristic hovering and swooping habits, as also the white-breasted kingfisher, a bird whose habits do not keep him always near water. A Brahminy kite would daily wing his solitary flight along and right up the valley following the stream. A pair of Red-wattled lapwings (*Lobiranellus indicus*, or better known as " Did-ye-do-it ") also claimed this beat.

Snipe were scarce in the swamp this year, as they have been in most places in South Indfa. A trace of jack snipe were put up where usually there would be a dozen. The swamp is this year under cultivation and is therefore more disturbed than hitherto.

Amongst the bamboo and light jungle bordering the river bank and near the Rest House, quite a number of small birds lodged. There were numbers of the golden Oriole although I failed to notice the Black-headed Oriole said to be common in Travancore. In the middle of the day its harsh mewing cry was very persistent and its mellower whistle seemed reserved for mornings chiefly. A diverting visitor was the Ruby-throated Bulbul (*Pycnonotus gulares*) a particularly assertive and cheery little bird always in couples with a call which seemed to say in shocked accents : " Just look at his dirty face ". Baker and Inglis say this is a rare bird confined to but ten forests of the west coast up to 2,500 feet, but this statement is hardly, as it stands, susceptible of check.

Another bulbul was the Southern Red-whiskered Bulbul with the rather crackjaw official label of *Otocompsa emeria fuscicaudata*, very common in small groups with other birds. It was not easy with the naked eye to detect the tuft of crimson feathers behind the cheeks (although easy enough with glasses) but there is no mistaking this bird, which has a white throat and chest with a dark brown " collar."

The Red-vented Bulbul, perhaps the best known of this sub-family throughout most of India in gardens and open places, has also a very cheerful call. I also picked out the South Indian Black Bulbul (*Microscalis psaroides ganeesa*) a bird with rather a small crest associating in high trees but resident usually at elevations of 3,000 feet and over; doubtless he is a winter visitor to Nedungayam. He looks at first sight rather like a drongo but is smaller and has a harsh cry.

A bird somewhat puzzling to beginners and at times possibly apt to be mistaken for a species of the Bulbul tribe on account of its crest feathers is the young male and the female of the Paradise Fly catcher. The male bird after the fourth moult is well known and at once recognisable on account of its beautiful white plumage, long tail-feathers, and graceful streaming flight. The young male and female however have a rich chestnut plumage except on the head and neck which is bluish black, and there are no long tail feathers. This bird was frequently seen in the open scrub along the river bank. A visitor also to the lantana scrub was the purple-rumped Sunbird, a small bird with metallic coloured plumage usually in small flocks.

The Southern Tree-pie (*Dendrocitta leucogastra*) is a beautiful bird said to frequent only the tree tops in

company with the Racquet-tailed Drongo (*Dissemurus paradiseuo malabaricus*); certainly there were great numbers of the latter in the teak plantations, and both occasionally came to perch on the bamboo clumps by the river. The common Black Drongo or King Crow was also evident every where. Amongst the arboreal species were also seen the Scarlet Minivet (*Pericrocotus speciosus*) although never in repose at close quarters long enough to give one time to admire him.

The Forests of Southern India.

By. A. Wimbush, I. F. S.,
Chief Conservator of Forests, Madras.

Under the auspices of the Madras Geographical Association, Mr. A. Wimbush Chief Conservator of Forests, delivered an interesting lecture on " Forests in South India. "

The following extracts from it should be of interest :

There are a great many different types of forests in South India probably many more than in the North. Over vast areas in the North there are forests a great portion of which contains one predominant species—Sal.

Now in the South of India there are many diverse climates, and places at no great distance apart vary tremendously in the matter of rainfall. Again every elevation is met with in South India from sea level up to over 8000 ft. and in a great many districts there are hill ranges of greater or less extent going up to elevations of—say—3000 to 5000 ft.

Rainfall and elevation perhaps play the greatest part in influencing the type of forests found in different localities. But there are other things, as for instance, the nature of the soil and underlying rock which are also important. I think that before we go any further it will be interesting to name some of the chief types of forests found in Southern India.

Roughly speaking, it is on the west of the peninsula that our most important forests in Madras are found, Between the sea and the Western Ghauts much of the land is of course under cultivation; but a typical feature is the series of low hills, frequently of a lateritic nature, which are interspersed amongst the paddy fields. These low hills for the most part contain a deciduous type of forest, that is to say, one in which the trees are leafless during an appreciable time in the hot weather. There are, however, places in this tract of the country where a type of forest almost or entirely evergreen occurs. On ascending the Western Ghauts from the west the type of forest becomes more and more evergreen and in fact after ascending a few thousand feet we enter what are termed the tropical rain forests. There are many different species of trees in these tropical rain forests and, for the most part, the species are quite different from those found in the deciduous forests already mentioned. The trees grow to enormous heights. The crowns form a completely closed canopy overhead and during the hottest time of the year it is possible to walk about in complete comfort with a hat on. These tropical rain forests stretch from the North of the Presidency in South Kanara right down through Malabar to the Palghat gap and further south than that they are found along the frontier between Travancore and Tinnevelly as well as in the Anamalai Hills and various outliers from the Ghauts including the

High Wavy Mountain in Madura district. On the tops of the hills, as for instance the Nilgiris, we get above the typical tropical rain forests, into another type where the growth, although still evergreen, is very much smaller both in height and thickness. This type is known as *shola* and those of you who have been to the Nilgiris or Palnis will be familiar with the rolling Downs covered with short grass intermingled with the well known sholas which occupy so many of the moist depressions on the plateaus.

Some of the most interesting and valuable timber forests in South India lie on hilly ground intermediate between the forests of the plains and the tropical rain forests. Such forests are found in the Wynaad of Malabar and Nilgiri districts and the west of the Anamalais at elevations between about 2000 and 3000 ft. These forests are typically deciduous and the most important tree which they contain is the famous teak. In nature teak does not grow gregariously i. e., as a pure crop. On the contrary it is found scattered amongst numerous other deciduous species only a very limited number of which are of economic value.

Going eastwards from the Western Ghauts we rapidly get into areas where the rainfall is very much less than it is on the west and south of the Ghauts. In places the change in rainfall occurs at an interval of very few miles, for instance near the Palghat gap which as you know is the gap in the Western Ghauts through which the railway from Madras to Calicut and Mangalore passes. The rainfall in Malabar on the west of this gap probably exceeds 100 inches whereas a few miles on the east of the gap the rainfall is less than 30 inches. All this has an immediate influence upon the types of forest which are found. As we get to the east trees are very much smaller both in

height and in diameter, and over vast areas stretching from the eastern side of the Western Ghauts practically up to the east coast, the forest may be described as mixed deciduous fuel forests. There are vast numbers of different species in the forests, some of economic value and some comparatively worthless and a great many of the species are entirely different from those found on the west of the Ghauts and of course are completly different in species and appearance from those found in the tropical rain forests.

Roughly speaking in the centre of Southern India including large parts of Mysore and Coorg we have a large tract of country with very moderate rainfall and at an elevation of about 2000 ft. rising to 3000 or 4000 ft. on many of the hill ranges which are so common in this part of the country. This tract of country is the home of the famous sandalwood. Sandalwood like teak is not gregarious but grows scattered about amongst deciduous species and for some reason or other it is particularly fond of the hedgerows and old village sites in the neighbourhood of cultivation.

On approaching the East Coast for instance in Chingleput district, a type of forest is met with which is semi-evergreen in character. Many of the species are quite different from those met with further to the west and although many of the individual trees are leafless during part of the hot weather yet much of the undergrowth and shrubs retain their leaves with the result that you never get the completely leafless appearance so characteristic of true deciduous forest in the hot weather.

Farther to the North on the East Coast are found what are known as Mangrove forests. These forests form a distinct type of their own. Several different species are

found in these mangrove forests and the chief factor influencing the constitution of these forests is the tide which submerges portions of the area covered by these forests twice every twenty-four hours. Some of the species in these tidal forests are provided with curious knee joints which enable them to breathe even though their main root system may be submerged by the sea water. On the very north of the East Coast of the Presidency are found the only Sal forests which exist in the Madras Presidency. They form the South-eastern extremity of the vast sal belt which stretches through Bihar and Orissa, Bengal and Assam and along the foot of the Himalayas up into Nepal, where sal probably is at its optimum. In Ganjam the sal is found growing pure in certain favourable pockets whilst in between the patches of pure sal are deciduous forests of other species.

It would perhaps be interesting to give some sort of idea as to why a limited number of species tend to grow gregariously, that is to say, to form pure crops of their own to the exclusion of other species. Various factors no doubt give rise to this gregarious form of growth If a particular species seeds prolifically, germinates as soon as the seed reaches the ground and having germinated is able to stand a considerable degree of shade over its head then supposing that in these respects that it has the advantage over any other species which would otherwise grow on the area, that particular species tends to form pure crops. This presupposes that the soil, climate and other essential influences are completely favourable to the species in question. Such a species is sal of which the botanical name is *Shorea robusta*.

It must be understood that types of forest which are subjected to external influences, most of which are connected with the existence of man, are not permanent or

constant but are subject to material changes; for instance if an evergreen forest is cut down by man the regrowth which will spring up on the area will be of an entirely different type from that which has been cut down and it will contain a large proportion of quick growing deciduous species. Should a forest fire get into such an area after the felling of the evergreen forest the change of type will be even more marked and for many many years afterwards a much degraded type of forest will be found in place of what previously may have been a most excellent evergreen forest. The reverse of this process is also taking place over many of the reserved forests of Southern India. Before the Forest Department came into existence and before the Madras Forest Act was passed in 1882 the forest of Suthern India were subjected to very severe mishandling at the hands of man. Not only was felling carried out indiscriminately but forest fires were rampant with the result that many areas capable of producing fine forest crops were only covered by a very much degraded type of forest in which the soil had deteriorated owing to constant exposure. Since the Forest Department took over the management of these areas the forests have been afforded a great degree of protection from excessive felling and from fire with the result that by degrees the forest is being restored to its normal type. This process of restoration is necessarily a very very slow one. There are cases, however, where it has proceeded far enough to bring about a tendency for a forest which contained a degraded type of deciduous growth 50 years age, to become ever-green. Instances of the two processes of destruction and restoration are to be seen in many parts of the Presidency. Round Salem for instance as you travel on the railway it is possible to study both processes. To the south of Salem Town may be seen a range of hills which is virtually

devoid of any tree growth. This range of hills which I have in mind is not in the charge of the Forest Department. To the north of Salem Towu are the Shevaroy Hills and the slopes of these hills which are in the charge of the Forest Department may be seen to be covered with a thick growth of forest. There is one place which I call to mind alongside the bridle path leading up the Shevaroy Hills where the whole process is apparent to the most casual observer. A cut line separates the Government reserve forests from an area which is not reserved. At this point quite a sharp distinction in the growth on either side of the line is most noticeable.

It is now necessary to consider the effects which forests have upon any country and more especially on the tropical countries such as South India. Forests have an appreciable effect upon the climate of the locality and they tend to make the climate more equable : that is to say less hot in summer and less cold in winter. Anyone who has had the opportunity of walking in a forest country during the heat of the day must have noticed that on entering a patch of really heavy forest the temperature is very appreciably lower than that in the country outside the forest. In South India it is only on the higher hills that frost occurs but if any of you have been at Ootacamund or Kodaikanal in the winter time you may possibly have noticed that whereas it has been extremely cold whilst you walked in the open grass land, a marked rise in temperature is noticed as soon as you enter a shola.

It is doubtful whether forests increase the actual amount of rain which falls in any given locality. It is after the rain has fallen that forests play the most important part. You will all realise that if you have a piece of

blotting paper in front of you on a sloping desk and have the misfortune to upset your ink pot on the desk the ink will run away from the bare wood and probably soil your clothes whereas it will not flow away rapidly from the place where the blotting paper is. Now this is almost precisely what happens when rain falls on a hilly area. The forests take the place of the blotting paper. After a heavy shower of rain, water will flow very rapidly off the bare portions of a hillside; but where a forest exists the water will be held up and instead of rushing off the surface of the earth it will tend to soak gradually into the earth. The result is that forests play the most important part in the storage of water which as you know is of importance in a country like South India.

By holding up the water in this way forests also prevent erosion. In a hilly country where the forest have been removed not only does rain water rush off very rapidly but it also carries with it great quantities of the surface soil. This soil is carried down the various nullas and often is deposited in the form of silt upon the agricultural lands at the foot of the hill, which of course is very bad for agriculture. In such a country when abnormally heavy rain occurs in addition to the erosion which takes place the danger of floods is greatly increased, for instead of the water being released by degrees and, after soaking into the earth, tending to raise the general level of the water table of the country at the bottom of the hills, the water flows away with the greatest rapidity and if any obstruction such as a railway embankment comes in its way floods are formed and as you know very great damage may be done to the surrounding country.

Forests are of use not only in holding up water as already described but in some places in holding up

drifting sand. In some parts of the world this question of shifting sand is of very much greater importance than it is in South India.

So far I have confined myself to telling you about what we call natural forests. In addition to these natural forests there are in Southern India many *plantations*, for instance on the Nilgiris are many plantations of the well known *Blue gum*, which is a Eucalyptus from Australia, which is planted in order to supply the large quantity of firewood required in the various hill stations. In addition to Eucalyptus there is a certain amount of *Wattle* which produces the beautiful yellow mimosa flowers which you may have seen. This species also is confined to the higher hill ranges and like the Eucalyptus it is a native of Australia. One species of wattle produces excellent bark for tanning and a private gentleman on the Nilgiris has planted up many acres of it in the hopes of selling it to the Madras tanners. By far the most important species, however, that is planted by the Forest Department is *teak*. This is grown in Malabar and on the Anamalais as well as in the Wynaad and elsewhere in suitable localities. The Nilambur teak plantations in Malabar are world famous. The first plantation there was made by a Collector called Mr Connolly in the year 1842. The oldest plantations have now become mature and the final crop is being clear felled each year and a new crop is being planted upon the same ground.

An interesting development of comparatively recent years in the Madras forests is the combination of agriculture and forestry. You may or may not know that in various parts of the country some of the more backward tribes have for generations been in the habit of cutting down and burning the forest on hills and sowing food

grains on the area. Their habit is to use the same place only for one or two years and then cut down a fresh bit of forest and repeat the operation. Needless to say this is extremely destructive and is forbidden in our forests as a rule. We have, however, devised a means of utilising this form of rough agriculture to our owns ends. In an area on which we wish to raise a teak plantation we first fell and remove all saleable trees and we then hand over the area to the jungle tribes who cut down the balance of the trees, burn them, and raise a crop of food grains, usually ragi or hill paddy. At the same time as they are preparing the ground for their cereal crop we plant teak stumps usually at an espacement of 6 ft. × 6 ft. and these grow up along with the cereal crop. The hillmen weed their cereal crop and look after our teak trees with the result that after the cereal crop has been harvested we have a teak plantation on the area. This system of combining agriculture and forestry has numerous different names in different parts of the country. The Burmese term is the one most universally known and it is called Taungya. In different parts of Madras it is known as podu, kumri, ponakad, tuckle, etc.

Having told you about the different types of forests in South India I think you will now be interested to hear something about their inhabitants.

To start with there are the various *jungle tribes* such as Kurumbars, Kaders, Mulsers, Khonds, etc. Most of these people are extremely simple and unsophisticated and are the very good friends of forest officers. Some of them, as for instance the Chenchus in the Nallamalais of Kurnool, have a criminal tendency but for years the Forest Department has been spending large sums of

money in civilising the people who are gradually becoming more and more amenable; like man-eating tigers they seldom interfere with forest officers.

Of the animals that live in our forests probably the *elephant* is the best known. Generally speaking these animals live in the better types of forest, for instance in the Wynaad and Anamalais and Malabar. The enter the tropical rain forests in large numbers at certain times of the year whereas most other jungle animals are comparatively rare inside these dark evergreen forests. Elephants are migratory in habit and at certain seasons of the year they roam from the west right through Coorg, Mysore and the Wynaad towards the Biligirirangan Hills and Bargur Hills of North Coimbatore and Kollegal. We catch these elephants in pits and use them for dragging our timber. Other most attractive animals are *Bison.* These enormous cattle stand as high as a big horse. They are very shy creatures and as a rule do no harm to anybody. Generally speaking they inhabit the same type of forest as the elephants do. ***Tigers, panthers, boars, wild dogs and other predatory animals*** are found in varyiug numbers throughout many of our forests. Their chief object in life is to keep out of the way of man and, except in rare instances where, for instance, an old or wounded tiger has become a man-eater, they are of very little danger to human beings. Other forest dwellers are various *species of deer* notably the sambhur and spotted deer. Sambhur live mostly on the hill ranges whereas spotted deer frequent the open grassy glades in the bamboo forests at lower altitudes. Deer especially are subjected to terrible persecution from men and in many places, where formerly they used to be common, they are in danger of extinction. This is largely due to the pernicious habit of shooting

from motor cars and by the light of electric devices during the night time, a procedure which cannot be too strongly condemned as being thoroughly unsporting.

In conclusion you might be interested to know a few of the *main functions of the Forest Department.* You will I hope have realised from the early part of my lecture the supreme importance of forests to the country as a whole from the point of view of protection and conservation of water supply. The forests are also, of course, a great source of revenue to the State and one function of the Forest Department is to harvest the legitimate revenue which the forests can produce whilst at the same time preserving and increasing their protective value. In forestry the tree crop and the soil on which it grows represent the capital of the business. Each year the crop grows and puts on what is known as annual increment. This annual increment is the interest which the capital produces. Now the difficulty is that it is impossible for the lay man to differentiate between the capital and the interest since they are so intimately connected together. Unless the greatest care, therefore, is exercised nothing is easier than to cut out more trees than the equivalent of the interest in order to make more money and in the process infringe upon capital. In privately owned forest where the owner of the day is usually in need of ready cash the capital is constantly being infringed upon with the result that in the course of years the forest deteriorates. In the case of the Forest Department who manage the Government reserved forests most careful working plans are made which prescribe the legitimate amount of felling which may be done each year for a number of years in advance. Obviously it is impossible to harvest the increment or interest from each individual tree. So what is done, broadly speaking, is to calculate the value of

timber which is equal to the total annual increment and then to remove this each year in the form of full-grown mature trees.

A great part of a Forest Officer's work of course relates to the protection of the forest from the depredations of man. They are helped in this by the Madras Forests Act of 1882 which gives them the necessary powers. This prevention of cutting trees which forest officers always have to insist upon naturally results in the Forest Department being not very popular with the people. The people cannot understand why if they want a bundle of sticks for their fire they should not be allowed to cut and remove them from the vast areas of forest that exist in the presidency. What a forest officer has to bear in mind, however, is the fact that although very little harm may result from one old woman collecting a bundle of sticks for her fire yet if the 350 million people in India all started collecting bundles of sticks for their fires there would very soon be no stick left either for them or for their descendants."

An Encounter with a Python.

By, S. Sundravarada Chariar, M. R. H.,
Range Officer, Mettupalayam.

The following is an account of an encounter with a python 11 feet long, 1½ feet girth, in the jungle of Nilgiri Eastern Slopes Mettupalayam Range, which I hope will be of some interest.

On 30–3–1935, while I was engaged with one of my Foresters and several Irula coolies in enumeration of dead Sandalwood trees for extraction, and tending of living ones, searching every bush in the Sandalwood area in the Nilgiri Eastern Slopes of North Coimbatore District, on

the plateaux, we came at about 4-30 P. M. to a locality partly semishola and partly scrub infested with a matting of heavy creepers and smothering Sandalwood trees young and old.

During the process of cutting creepers and freeing Sandalwood trees we were startled by the hiss of something which began to move under the matted creepers of a neighbouring bush with a dull speed. A close watch in the direction of the rustle revealed that a reptile was having its sojourn in this solitary place with impunity.

As we were gazing from a distance of a few yards, the creature moved slowly to a basin like pit covered with dry leaves, wound its body in a curl on itself, and thrust its head which was not easy of perception underneath the dry leaves.

Some of us gathered courage and slowly approached the animal to have a *darsan* at close quarters. Lo! What we saw was a big python encircling itself four fold, with beautiful broken patches of dark and white hue on the skin on its upper portion but emitting a most repulsive smell.

It was then a difficult problem to dislodge it from its position of vantage. Excepting one or two, the rest of the Irulars were unwilling to provoke the animal lest it should spring upon them and have an easy meal of any one of them. Hence they took care to fix themselves in the zone of safety and would not budge an inch. It took me nearly half an hour, to instil courage into them and slowly wean them all as I was anxious to get rid of the monster and make the area safe for our further work. The Irulars still trembling with fear—fear on one side that the monster would attack them in the event of their

getting near it, and in the other they would displease me if they kept silent any longer—set to work in right earnest by cutting creepers around the place of its resting. All the time the brute did not move a bit. It is likely that its capacity of hearing is extremely dull. To our utter dismay none of us had a gun though the necessity for it was very keenly felt then. One of the Irulars prepared a good long spike with a dead *Cassia fistula*, branch, and with its sharp end gave a thrust on the middle of the body as the head of the animal was not visible. The other Irulars were gazing with doubtful courage with their aruvals raised ready to rend the animal into several pieces. I almost thought that the brute's end was near but unfortunately it was not to be at least for some time. The moment the spike tickled the brute—the apparent piercing thrust of the spike was only a tickle as it could not plunge deeper than the surface skin, the latter being so strong and hard, out sprang the monster, fortunately in an opposite direction with its long and huge body exposed to full view. The Irula with the spike bumped out to the side like a rubber ball and his comrades with their spirit frozen and heart beating with high velocity ran in different directions some of them even dropping down their aruvals—all their exhibition of their courage having vanished in a second.

It was a wounderful sight to see a jungle monster in full form with an instinct all its own to escape the onslaught of its enemy; instead of straight finding an asylum in the bush all round, it rushed forward curling itself around a tall tree a few feet in front and went on climbing and hissing with ferocity until it got the top in three minutes, and hung its head down as if looking and mocking at its enemies.

At the outset there was a good chance for the Irulars to manipulate with advantage their sharp bill hooks and successfully plunge the same on its body. Unfortunately none of them had the courage to approach the animal but quietly acquiesced in its occupation of the position it has chosen. All the time they were blinking like monkeys that had tasted ginger. When once the animal was at the top of the tree, the courage of the Irulars seemed to return. Off went a volley of stones from the Irulars none of which injured the brute even slightly for sometime. The Irulars were soon exhausted. There was not a ghost of a chance of the brute coming down that day, and this made the Irulars grow all the more nervous to continue their work of tending. I too got equally nervous, conscious of the fact that unfinished work in this area will end in unpleasant results. I was between Scylla and Charybdis. Realizing the seriousness of the situation and find- the futility of my unimpressive rebukes I changed my attitude of anger to one of cajoling them by an offer of rewards. This had a magic effect. The Irulars exhibited their determination to finish off with the brute by some means or other. They again sent a volley of stones, this time some of them hitting badly and injuring the animal's mouth. Blood was dripping down and this injury appeared to have taken away its wonted vigour and ferocity, and the poor creature was reeling with agony making successive hissing noises, and the frequent gaping of its mouth indicated its exhaustion. Still it did not lose its hold and was clinging to the tree more closely, thwarting all their attempts to dislodge him. Then we tied end to end two "jallais"— long jungle wood poles, the top one having a hook at the end. The long "jallais" was then raised slowly to such a position that it enabled the Irulars to hook the body of the animal. All of them gave a pull

to the animal, but it clung more firmly than before. This struggle went on for a few minutes with dismal failure—the brute proving more than a match to the collective strength of all Irulars. At last after one desperate pull its weight on a slender branch gave way, and the animal was brought down with a heavy thud. The moment it reached the ground, it made a desperate dash to the neighbouring bush but unfortunately for him the Irulars unlike last time mustered sufficient courage, drew near him and with their aruvals gave a series of cuts and some of them hurled big stones to crush its head. The further move of this poor creature having thus been effectively arrested the Irulars inflicted a series of injuries and after all succeeded in despatching him to the other world. Then a funeral pyre was got ready and the body of the python was placed on it and cremated amidst the characterestic songs of the Irulars. Thus ended the last chapter of the python which a few minutes before in its wild state made the blood of every one curdle.

Readers will realise how handicapped we were in not having been in possession of a fire arm at a time when we most needed one and how the possession of it is imperative in the case of "jungle wallahs" in general, and particularly in the case of Forest Officers,—high or low. I hope this will stimulate my comrades in the field to knock again and again at the door of the authorities who have not yet seen their way to permit us to possess arms without license. As I see that every Forest Officer must have some training in shooting, I may submit my humble suggestion that shooting may form a part of training in the Forest College course, as in the Police.

[Our contributor will be doubtless pleased to know that musketry is now taught at the Forest College. — *Ed.*]

COLLEGE NOTES.

1. Marathon Race, 1935 :

The Annual cross-country race which is usually conducted in the month of March, was finally run on the 9th March. As is the custom, a preliminary run was conducted on the 2nd. On the final day there were in all 36 competitors out of the 42 students that form the present strength of the College.

All the students assembled in the College Athletic ground at 6-15 A. M. on the 9th morning. The Principal and the Instructors were all present. Just before the race was started the Instructors went to the different obligatory points along the course. The Principal started the race at 6-25 A. M. From the beginning, Junior student B. M. Boppayya took the lead and kept up to the last, finishing the course, which is exactly 7 miles, in 44 minutes and 25 seconds, which is a full minute less than last year's winner's record. There was no alteration in the course of that of last year. The following is the list of competitors who finished the course upto the 10th place in the order of merit. It may be noted that of these ten, five are Seniors and 5 are Juniors.

1. B. M. Boppayya (Junior Dn.)
2. Ahmed Sheriff (Senior Dn.)
3. P. S. Sivaramakrishnan (Junior Dn.)
4. K. R. Radhakrishnan (Junior Dn.)
5. C. J. Nanjappa (Junior Dn.)
6. A. Peravi Perumal Pillai (Senior Dn.)
7. M. S. Kuraishy (Junior Dn.)
8. C. P. Bhimmayya (Senior Dn.)
9. C. M. John (Senior Dn.)
10. P. Narayana Nair (Senior Dn.)

All the competitors, except J. P. Cherian and L. R. Sharma finished the course within the prescribed time. This inability on the part of these two was due to a bad ankle in the case of the former and an abrasion on the knee in the case of the latter, received during the run.

2. Tennis :

The Fischer Cup Tennis Tournament (Singles) was conducted this year with more than the usual interest, in as much as thirteen out of a total strength of 42 students, in the College, took part in the tournament as against 6 last year. Some of the matches were keenly contested and exciting to the finish—especially the two Semi-Finals, and the Finals and some good play was witnessed in these games. In the Final match, V. Govinda Menon of the Senior Division met and defeated N. Ramakrishnan of the Junior Division after an exciting game extending to 4 sets in all. Great interest was evinced in the tournament by the President, Vice-President, competitors and others alike and the Captain wishes to convey his thanks to all those who helped him to make the tournament such a grand success. The following are the results of matches played :

1st round.

N. Ribeiro beat J. P. Cherian 6-2 ; 7-5.
Mir Md. Ali beat M. L Mathur 6-1 ; 6-2.
Ahmed Sharieff beat T. R. Vijiaraghavan 6-4 ; 6-4.
Cyriac Pothan beat P. Narayanan Nair 6-1 ; 6-2.
N. Ramakrishnan beat C. S. Sivagnanam 6-1 ; 6-3.

2nd round.

N. Riberio beat W. O. Izhar Hussain.
V. Govinda Menon beat T. J. Abraham 6-2 ; 6-2.
Mir. Md. Ali beat Ahmed Sharieff 6-1 ; 6-1.
N. Ramakrishnan beat Cyriac Pothan 6-3 ; 6-0.

3rd round. (Semi Finals)

V. Govinda Menon beat N. Ribeiro 6-4; 5-7; 6-0.

N. Ramakrishnan beat Mir Md. Ali 1-6; 7-5; 6-3.

Finals.

V. Govindan Menon beat N. Ramakrishnan 6-3; 5-7; 6-2; 8-6.

The following are the Examiners for the subjects shown against them, for the final examination in June 1935 :—

D. M. C. Currie Esq., I. F. S.	....	Silviculture.
J. A. Wilson ,, ,,	....	Range administration.
A. L. Griffith ,, ,,	....	Physical Science.
J. A. Master ,, ,,	....	Utilization.
E. S. Dawson ,, I. F. E. S.	....	Forest Engineering.
J. C. Wrench ,, I. F. S.	....	Forest Management.
E. V. Padmanaba Pillai Esq., M. F. S.	....	Botany.

3rd round. (Semi Finals)

V. Govinda Menon beat N. Ribeiro 6-4; 5-7; 6-0.

N. Ramakrishnan beat Mir Md. Ali 1-6; 7-5; 6-3.

Finals.

V. Govindan Menon beat N. Ramakrishnan 6-3; 5-7; 6-2; 8-6.

The following are the Examiners for the subjects shown against them, for the final examination in June 1935:—

D. M. C. Currie Esq., I. F. S.	....	Silviculture.
J. A. Wilson " "	....	Range administration.
A. L. Griffith " "	....	Physical Science.
J. A. Master " "	....	Utilization.
E. S. Dawson " I. F. E. S.	....	Forest Engineering.
J. C. Wrench " I. F. S.	....	Forest Management.
E. V. Padmanabha Pillai Esq., M. F. S.	....	Botany.

EXTRACTS.

1. Fireproofing Processes :

Improving Wood as a constructional material—
The application of scientific research.

By M. SCHOFIELD, M.A., B.SC., A.I.E.

What Modern Methods aim at.

Possibilities of fireproofing wood have been under consideration for over a century. a commercial institution having offered a prize 125 years ago for some method of solving this problem. All types of chemical agents were tried out at first, with little regard to the corrosive action of the agent on metalwork and on delicate materials in proximity. There was a similar inefficiency in the case of fire-resisting paints which were introduced as alternatives to impregnating agents, the paints showing a tendency to peel off and leave the surface exposed.

All modern methods aim at producing one or more conditions which have been found to be effective in fire-resisting. There may be caused the evolution from the wood surface of a gas whieh is a non-supporter of combustion, and is preferably heavier than air and non-toxic; or the evolution of water of crystallisation from a salt; or the deposition of a fused coating or insoluble residue on the surface. It does not seem te be fully realised that the carbonisation of the wood surface may be caused by a fire even after any of the above processes has been carried out; for the charring of a wood surface is unavoidable, no matter what impregnating agent be used, since wood when raised above the temperature of 275 degrees C. undergoes a stong exothermic decomposition and evolves wood gas containing 33 per cent. carbon monoxide, together with smaller proportions of hydrogen and hydrocarbons.

What is aimed at in modern impregnating agents is to avoid the formation of a flame by creating an atmosphere within the immediate neighbourhood which is free from oxygen, the wooden structure being thereby free from the danger of collapse.

Some Methods Described.

Although some concerns inject fireproofing agents into wood by pressure alone, such treatment can only penetrate the surface layers. The only sure method is to place the wood in

cylinders and evacuate in order to remove the sap and wood gums, and then to inject the antipyrene solution. By this procedure not only are gums removed which contribute to the combustibility of the wood, but the cells of the timber are prepared so that they are in a receptive condition for the solution, and provided a longer time be allowed even large logs may be treated to the core without difficulty.

The International Fireproofing Corporation of America have protected a process in which the green wood is treated with 5 per cent. caustic soda solution at 100 degrees for 1½ hours in order to remove the resins. After evacuation of the plant a solution of calcium and magnesium chlorides, together with boric acid, is injected at 90 degrees, the pressure being 150 lbs., and after drying the wood a further impregnation with zinc and aluminium sulphates is carried out, the wood being finally washed with hot water. This is a typical example of the use of mixtures as impregnating agents, rather than the reliance on a single salt.

A most striking example of efficient practice is furnished by the Oxylene process as carried out by the Timber Fireproofing Company, Ltd., of Market Bosworth. In this process the timber is introduced into ths impregnating cylinders in a manner similar to the charging of large wood distillation retorts with large wood waste, viz., by placing the planks of timber in cylindrical lattice cars which run on rails into the impregnation vessels. The latter are steel cylinders of sturdier construction than creosoting cylinders, holding 600 cu. ft. of timber and being fitted with rapid-sealing doors. After a steaming process which loosens the sap, an evacuation removes the latter together with accumulated moisture, and the antipyrene liquid is then forced in. The timber is removed, stacked to dry in open sheds, and finally submitted to an artificial seasoning process by drying in hot air kilns.

Fire Tests.

Not only can the treated timber be cut, worked, painted, varnished, or polished to an equal degree compared with ordinary wood, but the impregnation imparts an additional property, viz., that of inhibiting fungoid growths and dry rot. There is no reason why this dual effect of fireproofing and preserving should not become a common feature of the timber industry in the near future. Costs of complete impregnation by the process named average 6½ d. per sq. ft. per one inch thickness of solid timber, while for plywood prices vary from 10 s. to 28 s. 3 d. per 100 sq. ft. according to thickness.

What is more important than intial cost is the efficiency of the process as determined by trial on an appreciable scale, rather than with small samples in the laboratory; for the resistance displayed by such samples in the latter case when presented to a flame is usually no criterion of the behaviour of large hollow structures of wood when exposed to a fire. Two wooden huts, one constructed of untreated wood and the other of wood treated by the Oxylene method, are used in tests at Market Bosworth, a petrol fire being started under each hut, and pyrometers are fitted to note the internal temperatures during the progress of the trial. Whereas the first hut is completely destroyed within thirty minutes, the second is seen to be still intact, charring of the outer surface being the sole result Further, since wood with a charcoal layer is a poor conductor of heat, a maximum temperature of 140 degrees F, is recorded in the latter case, so furniture and paper pamphlets scattered on the floor under which the fire had heen started were unaffected.

— *Timber Trades Journal, 29–9–34.*

2. Indian Laurel :

A New Method of Kiln-Drying.

A large number of Indian hardwoods present some difficulty in the matter of kiln-drying, on account of their refractory nature. Indian laurel (*Terminalia tomentosa*) is one of them, and Mr. S. N. Kapur, officer in charge of the seasoning section of the Forest Research Institute, describes in *Indian Forester* some interesting work carried out at Dehra Dun.

A large number of experiments have been carried out during the last ten years on the kiln-drying of laurel, and it has not been possible to dry it satisfactorily according to the usual method of kiln-drying, except in the case of planks not over one and a half inches in thickness, and that also with considerable consumption of steam. Kiln-seasoning trials with this timber carried out at the Government Timber Depot at Ahlone, Rangoon, have given similar results, and it is reported that the only satisfactory method of drying this timber is by steaming frequently during the process of kiln-drying, at first in a saturated atmosphere, and later, when the moisture content of timber had dropped below 20 per cent, at lower relative humidities. Working on this method, one inch planks have been dried from green condition to 12 per cent. moisture content in 24 days in an internal fan kiln.

Considering the length of period the timber has to remain in the kiln, and the repeated steaming operations, the cost of

kiln-drying would be too high for commercial practice (states the writer) and, further, it is highly doubtful whether thicker material could be dried on the same principle.

For some time past, work has been in progress at Dehra Dun on a new process of kiln-drying, which is expected to overcome the difficulty experienced with most of the refractory hardwoods. Briefly stated the process consists in circulating air in a kiln by means of fans fitted inside the kiln allowing the air to get heated for a short period, during which time the temperature rises and the humidity of the air falls, and then allowing the air to cool down by stopping steam to the coils. At the end of the cooling period, the air inside the kiln becomes fairly wet, and is exhausted into the atmosphere, and a fresh charge of cold air is drawn in, which is heated again, and the cycle is thus repeated.

During the heating stage, when hot, dry air circulates around a piece of timber, there is a certain amount of evaporation from the surface layers, which gives rise to a sort of moisture gradient, as well as to some drying stresses in the wood, but these are confined to the outermost layers of the piece, and soon disappear during the cooling stage, when the humidity inside the kiln rises to about the saturation point. In this this manner, at the end of each cycle, which may last from two to six hours, the timber is found to lose a certain amount of moisture, without suffering from any permanent set or case-hardening. As long as the timber is above the fibre saturation point, the relative humidity of air at the end of the cooling period approaches saturation value, but below that point the difference between the wet and dry bulb temperatures tends to become greater and greater, and when the difference amounts to about ten to twelve degrees centigrade, it indicates that the timber is dry enough to be taken out of the kiln.

Among the advantages claimed for the method are economy in steam consumption, simplicity of operation, the fact that the kiln can be shut down during the night period without any loss in efficiency, and the cost of drying with the new process is fairly low.

One inch planks of laurel have been dried successfully in 12 days from an initial moisture content of about 68 per cent. to 10 per cent moisture content, with no appreciable increase in degrade. This is perhaps the shortest time in which this timber has ever been kiln-dried. Scantlings of the same timber, $2\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. in cross section, have been dried in 21 days from 64

per cent. to 9 per cent., and the resultant material showea almost complete freedom from case-hardening stresses and d very uniform distribution of moisture in the wood.

Although the results obtained to date are fairly successful, it is not yet possible to state the best conditions of drying for any timber, as considerably more work has yet to be done. In addition to empirical trials of various arbitrary schedules, work is in progress at present to determine the loss of moisture in various stages of heating and cooling, the flow of heat into and from the wood and consequent charges in moisture content of various layers, the development of stresses in the wood, the necessary modifications to the kiln and numerous other factors.

For carrying out the process, an internal fan kiln with some slight modifications serves the purpose, and the author gives details of a successful kiln run of $2\frac{1}{2}$ in $\times$ $2\frac{1}{2}$ in. scantlings of laurel, together with recommended drying conditions for 1 in. planks of laurel.

— *Timber Trades Journal, 29–9–35.*

3. Toads Save Crop :

Biological control seldom extends to the importation of Amphibia, but great success has followed the establishment of the large toad *Bufo marinus* in Puerto Rico From two lots of of this species brought to Puerto Rico from Barbadoes and Jamaica, millions of descendants have sprung, and the food of this host has consisted largely of the May-beetle (Science Service, Washington, D. C.). The sugar crop, which is the staple product of the island, was threatened by great numbers of the 'white-grubs' of May-beetles, which swarmed everywhere in the soil, devouring the roots of the cane and of other plants as well, so that the planters were reduced to picking the grubs by hand. The introduction of the toad has reduced the May-beetles to scarcity, and the Porto Rican sugar crop has been freed from its worst enemy.

— *Nature, 8–12–34.*

4. Breeding Habits of Hornbills :

Although the extraordinary breeding habits of hornbills have excited comment for many years, little is actually recorded except that that the female is walled up in a natural hole, where she is fed by the male through a slit and undergoes a complete moult. Practically no one who has left notes has resisted the temptation to destroy the nest before the story was complete.

Recently Mr. S. A. Child has made observations at Longido on the small hornbill, *Lophoceros deckeni*, wlthout interfering in any way with the nest. He found that the female was enclosed for not more than 58 days (53 ± 5). Directly she emerged the hole was resealed, and she helped the male to feed the two young for another four weeks. A similar habit was recently established by Hoesch for *Lophoceros flavirostris leucomelas* in South-West Africa, and Schonland had inferred it years ago for *L. melanoleucos*. The habit is, therefore, probably generic.

We have had a nest hole of the big forest hornbill, *Bycanistes cristatus*, under observation near Amani for two successive seasons. The female did not emerge until the young were ready to accompany her. The dates she began to sit are known only within about four weeks; the dates of emergence are fixed exactly. She was immured for the astonishingly long periods of 159 days ± 16 and 137 ± 14 respectively. During these five months, the male was solely responsible for provisioning his family and, on the average frequency we observed for his visits, he brought food at least three thousand times.

— *Nature*, *8–12–34*.

5. Invert Sugar from the Cashew 'Apple':

In India the cashew, *Anacardium occidentale*, L., is largely cultivated for the nut, and the curious fleshly swelling of the axis beneath the nut is discarded. M. Srinivasan, of the Department of Biochemistry, Indian Institute of Science, has been exploring the possibility of utilising this fleshy 'apple' (*J. Indian Inst. Sci.*, 17-A, Part 7). Alcohol could be obtained from its juice by fermentation, but the costs involved would not warrant large scale production; on the other hand, the juice contains about 7 per cent invert sugar on the fresh weight of the apple and may easily find a use as a syrup. Pigments present in the juice render more simple its correct neutralisation by lime, and at neutralisation there is complete precipitation of albuminoids and tannins so that filtration is easy. The lime has then to be removed (as carbonate, sulphite or phosphate), before the juicc is concentrated, when it yields a clear red syrup for which there may well be considerable demand, as invert sugar is in great use by confectioners. It may also serve as a useful sourse of lævulose, the sugar to which diabetic patieLts show so much tolerance.

— *Nature*, *3–12–34*.

6. Imperial Botanical Conference :

An Imperial Botanical Conference, commencing on August 28 and lasting two to three days, according to the programme which may finally be arranged, will he held in London this year. The subjects set down for discussion are of general interest to Empire botanists, and include such topics as pasture research within the Empire, the ecology of tropical forests, the application of ecological methods to the study of native agriculture, problems of fruit storage and transport with special reference to tropical conditions, the furtherance of schemes for the closer co-ordination of botanical research within the Empire, etc. It is hoped that this Conference will furnish a convenient meeting ground for home and overseas botanists who are on their way to attend the International Botanical Congress which meets at Amsterdam in the week following.

— *Nature, 5–1–35.*

7. Digestion of Wood by Insects :

Since Lyonet in 1762 carried out the first crude experiments designed to discover how wood is digested by insects apparently feeding on it, a large number of investigators have attacked this fascinating problem. The history of these researches and the latest conclusions are very concisely surveyed in a recent paper. The main conclusion is that the role in the digestion of wood of intracellular micro-organisms, often present in xylophagous insects, is not so important as was thought by many authors; indeed, some wood-eating insects proved to be free of micro-organisms and yet able to survive on a wood diet, being able to secrete cellulose. The micro-organisms of others have been cultivated *in vitro*, and found to be unable to break down cellulose. In wood-eating termites, the intestinal Infusoria are utilised as a direct source of food, so that these insects should be classified as feeding on micro-organisms, not on wood. Many true wood-eaters do not depend upon cellulose and have no cellulase, but utilise starch and soluble sugars in the wood. Nitrogen is obtained probably from proteins which are practically always present in wood, while proteolytic enzymes have been found in most wood-eating insects. This makes superfluous the assumption that micro-organisms fix atmospheric nitrogen for the use of their host.

— *Nature, 19–1–35.*

8. Cold Weather Planting in Northern India :

In the Forest Bulletin "Cold Weather Planting in Northern India" Mr. H. G. Champion, sylviculturist, Dehra Dun, deals with the planting problems in the United Provinces. Except where irrigation is an economic proposition, practically the whole of plantation work has to bo done at the break of the rains, when the necessary labour is usually very difficult to procure and, even if obtained. is very liable to leave the work or be largely incapacitated by malaria and other complaints due to the general dampness, and to the unsatisfactory condition of the drinking water. After an allusion to the *tauugya* methods of obtaining new crops, which are proving tn some cases so great an assistance, Mr. Champion says that were it possible to do any appreciable part of the work in the cold or early hot weather, it would be most advantageous. Cold weather work would be of value because, for nearly all species, the most rapid growth occurs in the first week or two of the rains, or even before the monsoon has set in definitely enough for most planting work. This period is lost if the plants are only recovering from transplantation or the planting out work cannot all be completed in the very few early favourable days. This is an interesting comment since experiences in West Africa, under rather different conditions, are pointig in the same direction. The bulletin describes ;experiments made between 1927 and 1932 at Dehra Dun on planting out entire plants or stumps of thirty-three tree species after good winter rain, and a few trials of planting at regular intervals throughout the cold weather. As would be expected, the results varied greatly with the amounts of rainfall during the year of experiment, but very few species proved satisfactory. Teak stumps planted in March in the shade give good results provided the monsoon is not delayed, which has happened only twice in the period at Dehra Dun, but they may succeed in most years in more favourable localities.

— *Nature, 19–1–35.*

9. Wedding gift to the Duke of Kent :

One of the wedding gifts to the Duke of Kent is of special interest to the timber trade. It is the smoker's cabinet presented by the Empire Forestry Association, and is, quite fittingly of course, of Empire timbers. Those who have seen it have admired the choice woods and their blending together to make a complete whole that is outstandingly beautiful. The cabinet is constructed of three woods, the outside being of Indian laurel (*Terminalia crenulata*), the top Coromandel wood from Ceylon, and the interior rising board of Canadian bird's-eye maple. * *

In the cabinet are three ashtrays. The match holders are of sandalwood and Borneo red ceder ... ... A novel feature is a small cabinet inside the cabinet, of teak from Burma and Indian silver-grey wood (*Terminalia bialata*) from the Andamans, giving a list of the timbers and their countries of origin.

— *Timber Trades Journal, 1-12-34.*

10. Forestry in India :

Some disturbing features—Services affected by Economy Measures—Teak Situation.

The economic and commercial aspects of Indian forestry were dealt with in a lecture which Mr. A. D. Blascheck, president of the Forest Research Institute, Dehra Dun, delivered before the Indian section of the Royal Society of Arts in London on the 14th inst. The lecture was illustrated by cinematograph films of Mr. Blascheck's flight over the Andaman Islands and of elephants working in a forest.

Sir Reginald A. Mant, K. C. S. I., K. C. I. E., late member of the Council of the Secretary of State for India, who occupied the chair, said the work the Indian Forest Service had rendered to the forests had been of immense value to the rural population of India. The all-India service was with the growth of self-government in the provinces, doomed to extinction. They might hope that its traditions, together with the traditions of the other great British services, would live on and inspire the new administrations which were shortly to be called into being.

Mr. Blascheck, in his address, said the area of forest under the control of the Forest Department was 961,000 sq. miles, an area more than twice that of the British Isles and nearly 24 per cent, of British India. Much of this forest was at present inaccessible or unprofitable, but 82,000 sq. miles were managed in accordance with working plans which provided for a sustained yield of timber or other produce. In addition to the Government forests there were large areas of forest in some of the States and considerable areas privately owned.

Tke Revenue and Economic Value.

Forestry in India was intimately connected with the welfare of millions of the population, and trade in forest products made a large contribution to the wealth of the country. The increase of revenue from the forests was continuous until the world economic crisis began in 1930. Revenue in the Forest Deparment had increased tenfold in fifty years, and post-war demand and

high prices raised it still further to £ 1,750,000 in Burma and £ 3,000,000 in India proper, with a total surplus of revenue over expenditure of nearly £ 2,000,000. Since 1930 the revenue had fallen, but the returns for 1932–33 showed some improvement, with a net revenue of £ 650,000. These figures took no account of large quantities of forest produce provided free of charge, nor of the full value of produce supplied at concession rates.

The Teak Trade.

Until the world crisis began the out-turn of timber from Government forests had steadily increased. In 1928–29 it was as much as 2,500,000 tons, or double what it had been twenty years earlier; in 1932–33 the out-turn was 1,700.000 tons. The increased consumption was no longer fully maintained, but general demand was again improving.

The railways were the largest consumers of timber, and they were effecting every posible economy in maintenance as well as construction They required normally more than 160,000 tons of timber a year in the form of sleepers alone, and a further 40,000 tons in the construction of carriages and wagons. Most of the sleepers were sal (*Shorea robusta*), deodar (*Cedrus deodara*), or teak (*Tectona grandis*), but high prices had encouraged the use of cast iron and of less durable timbers.

The lower initial cost of wooden sleepers had always been in their favour, and prices were now again adjusting themselves to compete with cast-iron sleepers when cost of delivery, laying and maintenance was included.

Teak was the only timber for which there was a large demand outside India, but, in spite of its relatively high price and the large supply of other timbers available in India, the total imports used to exceed exports. Excluding railway sleepers, which were no longer imported, there was before the war an advance balance of £ 500,000 in the external timber trade. Larger exports of teak at about double the pre-war value turned the balance of trade considerably in India's favour for a number of years, but since 1931 equilibrium had barely been maintained, owing to much smaller demand for teak. Exports of timber other than teak were small.

Imports of teak from Siam and Indo-China used to complete with supplies from Burma; they were now a quarter of what they were formerly.

In a reference to imports, the lecturer mentioned that ply-wood was now the chief manufacture of wood supplied from abroad; it was imported in very large quantities for tea chests,

and it was also sold for all manner of purposes. The manufacture of three-ply chests in India was started during the war, and two mills in Assam continued the supply; they made excellent plywood, but even with an import duty of 25 per cent. the bulk of the 3,000,000 chests used annually were imported.

Forest Research.

India now enjoys the results of some 70 years' regulated use of her forests and development of their yield. Progress in silviculture and in the utilisation of forest produce had been continuous; but, until a small staff of research workers was appointed at Dehra Dun, in the United Provinces, the success of individual forest officers was frequently unknown beyond the the province in which they worked.

In 1914 the first Forest Research Institute was opened, and very shortly war demand for forest produce proved the need of still wider research. Plans for expansion were made, and in 1929 the present Forest Research Institute, the finest in the Empire, was opened. The Institute undertook and co-ordinated both silvicultural and economic research and the associated botanical, entomological and chemical investigations. Silviculture in India presented the widest variety ot problems, and their solution was of primary importance since future supplies and revenue depended upon maintenance, improvement, and ultimate reproduction of a large variety of crops. On the other hand, economic forest research in India not only had to determine the properties of timbers and other products, but it had to supplement private enterprise by developing and encouraging their use.

The Forest Research Institute had promoted the wider use of many timbers and other products, and on the economic side it could claim to have helped to establish the use of creosoted timber by the railways, the manufacture of paper from bamboos, tho manufacturer of plywood, and the distillation of rosin and turpentine.

The Economic Crisis.

The steady growth of forest revenue for so many years had stressed the commercial importance of forestry in India, and when the slump came all manner of economies were suggested with a view to restoring the financial results. Prices and markets for forest produce had shrunk; some forests could not for the time being be worked at a profit, but others needed more intensive management to ensure future supplies and to maintain or develop profitable trade.

It had been forgotten that 70 years ago regulated forest management was started, when few people believed remunerative management of the forest possible; the humbler classes living in or near the forest did not appreciate the need of regulating their increasing demands, and there was still a general lack of public opinion recognising the need of preserving and developing the forests. As a result, the staff of the Forest Department was being reduced to the bare minimum. In all provinces the area of charges had again been increased, recruitment had been suspended, and many specialist posts had been abandoned. Even the need of scientific training for the staff and need of working plans based on scientific principles had been questioned. The Forest Research Institute had survived, though its closure or the abandonment of silvicultural research was suggested; its activities will suffer from reduction of its own staff, and still more from lack of the co-operation of research staff in the provinces.

"These are the most disturbing features of forestry in India at the moment," said the lecturer, "and they are likely to be intensified if forestry is entirely provincialised under the new constitution."

The slump in the market for teak had been disastrous for revenue in Burma, and increasing local use of substitutes for timber, and reports to the same effect from other countries, had caused some pessimism. The staff of forest officers was being reduced to nearly half, and it had been suggested that natural supplies of teak would meet all future requirments, and that there was no need to develop the out turn of the forests by plantation.

"It is true that general trade depression may not be wholly responsible for the reduced demand for teak, but its effects have been accentuated in the case of timber so widely used for ship-building and stocked in large quantities, Teak is a timber that has unique all round qualities, though it is not, as its popularity in India suggests, the best Indian timber for all purposes; harder and stronger woods are avilable, and they are more suitable in some cases. World demand for teak has declined owing to restricted shipbuilding, and its high price and lack of recognised grading has discouraged its use for other purposes.

"There is no occasion to condemn past policy of developing the teak forests; immediate supplies as a whole may be excessive, but the largest possible out-turn should still be established by plantation in selected forests. Twenty five years ago Burma exported 48,000 tons of teak with a shipping value

of £ 10 per ton to the United Kingdom and to foreign countries, and 130,000 tons with a value of £ 6 per ton to India. Much larger quantities have been exported since then, and even in 1932-33 the quantities exported were 16,009 and 127,000 tons; the value were then £ 20 and £ 10 per ton."

Scope of Development.

In India as a whole many timbers need to be made better known, and both the home and the export trade need better organisation. The scope for development was undeniable in view of the immense variety of timbers and other forest products available. In some cases their properties had still to be scientifically determined; in other cases supplies had to be surveyed, and in the case of timbers recognised grading rules must be applied. Most of the research work could only be done at the Forest Research Institute, but the results must be demonstrated and applied and means ef extraction improved with the co-operation of the Forest Departments in the provinces; private enterprise and trade initiative were not enough.

The Grading Rules for Empire Hardwoods issued a year ago by the Advisory Committee on Timbers at the Imperial Institute would give an invaluable lead to better organisation of the timber trade in India, and application of the rules should help to expand the export market.

The economic as distinct from the strictly commercial aspect of forestry might suffer even more from changes of policy. Forest preservation must be secured by a permanent policy * * * One of the main difficulties in financing forestry work in India was that the cost of forestry, agriculture, etc., was borne by the Central revenue, but the benefits accrued to the provinces.

— *Timber Trades Journal*, 22–12–34.

11. Seven Rogue Elephants Shot in Six Months :

The destruction of seven rogue elephants in six months is the record set up in the Coimbatore District. Days were when the shooting of a rogue elephant was a rare occasion. Owing to the increase in breeding among the growing mumber of wild elephants, the elephant menace in the Coimbatore District had become a real problem, so that even the Wild Animals Protection Act had to be amended to permit of shooting cow elephants on private lands bordering forests.

Early this year there were as many as ten elephants prescribed as " rogues." Of these, seven dangerous rogues have been shot dead by leading big game hunters.

The Reverened Brother Romulus, a Franciscan clergyman, who is running a colony for the reclamation of forest tribes in Talavadi on the British territory bordering Mysore State, is responsible for shooting two rogues. In shooting the first of these brutes, he almost lost his life and that he is alive to-day is due to the elephant's shooting itself when it snatched the rifle from his hands. It was a case of hunter being hunted when the elephant charged him from a distance of fifteen yards.

Mr Randolph C. Morris, a member of the big game expedition which is shortly leaving for Burma and the Federated Malay States, shot another of these rogues in April last.

Accompanied by Major C. F. Marriot of the Senior Officers' School, Belgaum, Captain Chaytor of the 14-20th Hussars shot a rogue elephant in September last when it actually charged the party.

Another elephant similar in appearance was shot by Mr. E. S. Dawson, Forest Engineer, who was charged by the same rouge elephant last year. This elephant recently chased a survey party working in the North Coimbatore Reserves and everybody had to take cover. When the party resumed work they were again charged and Mr. Dawson shot it dead.

Mr. F. R. Madan, Conservator of Forests, shot a maimed rogue on the Anamalais recently.

Only a couple of months ago the villagers on the border of the Coimbatore-Malabar districts killed a rogue which accidentally fell into an elephant pit.

— *Indian Forester. Feb. 1935.*

12. Malaria in Ceylon :

There is unfortunately no doubt about the serious nature of the epidemic of malaria in Ceylon. The telegrams in the Press, report that in the affected provincess no less that 3,435 deaths from malaria and fever occurred during the month of December, compared with a monthly average of 531 for the first nine months of the year. It is admitted, however, that these figures are not final. It has been reported that there have been more than half-a-million cases of malaria, and if the death-rate was 5 per cent, that would give us something like 25,000 deaths.

The first need in an outbreak like this is medicine and food, and the Government of Ceylon has been in the happy position of being able to draw supplies of quinine from both

India and Java. There is, however, another greatly complicating factor, and that is famine. The drought which has prevailed—and is generally regarded as the cause of the epidimic—has led to a serious failure of crops, and, even if the rain had not failed, the people themselves have been so weakened by disease that they have not been able to cultivate their fields. We may therefore expect that, in a people weakened by want of food and by malaria, this epidemic will be followed by a serious outbreak of dysentery and a rise in the general death-rate from all causes.

The epidemic itself has not been caused as epidemics frequently are—by the introdution of non-immune people into a malarial territory. The outbreak is in a part of Ceylon which is normally healthy. The new factor has in all probability been an increase in the number of mosquitoes. Among any healthy population in the tropics there is always a certain number of people carrying the infection; and when, as appears to be the case in Ceylon, there is a large increase in the number of mosquitoes, it is easy for the mosquito to acquire infection and to start a serious epidemic. Once a mosquito is infected it remains infected for life; and, further, as this epidemic is occurring among people who are not accustomed to malaria, the epidemic is so much the worse.

Valuable entomological work has been done in Ceylon by the Government Entomologist, but in view of this great epidemic there must be a full reinvestigation. Until we get that, everything is necessarily speculative.

One hypothesis is that, owing to the drought, rivers are not flowing so rapidly as they usually do, pools remain in the rocky and sandy beds, and *A. culicifacies* is breeding profusely. That may be so, but we must not forget that there are some thirty sepcies of *Anopheles* in Ceylon and that the include species of the *A. minimus* group and *A. maculatus*, which in other countries are important carries of malaria. A grave mistake might be made if a full investigation is not made into what mosquito, or mosquitoes, have been the active agents in producing this epidemic in the various parts of Ceylon to which the epidemic has spread.

Obviously the people of Ceylon were not prepared for a great epidemic; it will be necessary for them to take stock of their position. The ancient cities buried in the jungle are a reminder that malaria is no new disease in Ceylon. Governing authorities should ask themselves; Have they used the

knowledge that Ross gave them to the fullest possibe extent, or have they made no special effort, thinking that nothing could be done ?

Clearly some sort of inquiry will inevitably be held, but what is required is not so much a search for a scape-goat or an inquest, as a constructive scheme for the future, built on a sure scientific foundation.

— *Nature, 26–1–35.*

13. Government Review on the Administration Report of the Forest Department, Madras, for the year 1933-34 :—

The continued economic depression affected the trading results of the department. Revenue decreased during the year owing to a reduced demand for timber, and for railway sleepers in particular. Fuel and other minor produce also brought in decreased revenues. There is a drop in revenue from sandalwood also.

The area of reserved forest decreased by 6 square miles, but that of reserved lands increased by 56 square miles ; while the area of Ryots' forests showed a reduction of one square mile.

There was an increase of 660 tons of timber felled by Government agency in reserved forests, while there was a decrease of 2,220 tons in unreserved tracts. The quantity removed by purchasers increased by 1,780 tons. There was an increase in the quantity of fuel removed by Government agency and a decrease in removal by purchasers. Sales of sandalwood declined both in price and quantity. The value of minor forest produce sold decreased. The experimental manufacture of sealing wax and wood polish is of interest; but it does not appear probable that there will be any extensive market for high quality sealing wax.

One million four hundred and fifty-eight thousand five hundred and twenty-nine animals were admitted to grazing during the year, a slight increase over the number of last year. This increase was reflected in the amount of grazing revenue realized which also showed a slight increase. Free permits account for a loss of revenue of nearly Rs. 50,000. A decrease in the number of permits issued is recorded against panchayat forests.

An increase is noticed in all forms of offences reported. It is satisfactory that there was an improvement in the proportion

of cases investigated by Rangers, and the percentage of convictions obtained is satisfactory. There was extensive illicit goat browsing in one range in Cuddapah. It is hoped that the co-operation of the revenue authorities will lead to an improvement in the situation in that range.

The special investigation into the spike disease of sandal has been abandoned; but investigations in this matter will be continued by the Provincial Research staff. Lantana is a wide-spread pest and efforts to eradicate it should be continued and extended.

The account of sylvicultural work is interesting and the Government are glad to note the testimony of the Chief Conservator that the accumulating results of this work are likely to prove of the greatest benefit in the adoption of measures for preservation and regeneration of forests.

Working plans have been prepared for nearly 11,400 square miles, and only an area of 2,080 square miles is not now covered by working plans.

In his report, the Chief Conservator describes the services the Forest Department has rendered to the general community, which show that, consistently with sylvicultural interests, the department makes every effort to meet all the reasonable domestic and agricultural requirements of the people. It is regrettable that in a few eases the people have not availed themselves of the facilities made available to them. The removal of manure leaf is unfortunately in some places still necessary, but it is gratifying to note that people in Tinnevelly have lessened their demand on forests for this manure.

The Forest College.—A large number of Government students from this Presidency were trained and the net cost of the College increased. Three vernacular training schools were held.

The system of issue of permits through departmental subordinates was continued, and Government departments were circularized requesting them to consult the Forest Department in respect of their timber requirements and, as far as possible, to place orders with the department instead of insisting on Burma teak.

The relation of the department with the hill and jungle tribes was good and the report records the directions in which their services were enlisted for execution of departmental work, the special concessions shown to them and the measures undertaken for their benefit.

14. All India Conference for the Preservation of Wild-life :

This was held in January last in New Delhi. There were about sixty delegates both officials and non-officials present, Mr. C. G. Trevor, Inspector General of Forests, presiding.

The following are details of outstanding importance discussed at the Conference :—

The duty of preserving the fauna in the forests was definitely laid on the Forest Department, and the importance of nature-study and provision of suitable text books in secondary schools was emphasised. The importance of detailing Forest officers on special duty for the preservation of wild life was mentioned by several speakers. The inoculation of domestic animals against disease was recommended. The regulation of the sale of game birds in the towns, in or out of season, resulted in a keen discussion ; some of the members felt that total prohibition of sale of any kind of game was essential, but the conference was unable to agree to this, though there was general agreement that sale should only be allowed under restrictions. The conference was of the opinion that shooting wild animals from motor cars and the use of artificial light should be prohibited. The legislation recently enacted in the Punjab on this subject was highly commended and similar legislation elsewhere was strongly recommended. Propaganda for educating the public by wild life societies was advised, and certain restrictions in the issue of licenses for the protection of crops were called for...........

— *Indian Forester, March 1935.*

Notifications Relating to Rangers.

The following promotions of Rangers are ordered :—

I.

With effect from the 29th August 1934, vice N. Gopalan Nayar, Ranger VI grade, retired from service :

1. Mr. Y. Vaidyanathan from Sixth grade S. P. T, to Sixth grade permanent. 2, Mr. R. Rama Ayyar from Seventh grade permanent to Sixth grade S, P. T. Mr. V. N. Parthasarathy from Seventh grade S. P. T. to Seventh grade permanent. 4. Mr. S. Varadarajulu Reddi from Seventh grade temporary to Seventh grade S, P. T. 5. Mr. P. Krishnan, Forester First Grade, to be temporary Ranger on Rs. 75,

II.

With effect from the 29th October 1934 vice Ranger S. W. Fernandez, IV Grade, deceased :

1. Mr. K. G. Monappa from Fourth grade S. P, T. to Fourth grade permanent. 2. Mr. K. Dooma Shetty from Fifth grade permanent to Fourth grade S. P. T. (His promotion will however. take effect only from the 1st January 1935). 3. Mr. K. Kunhiraman Menon, from Fifth grade S. P. T. to Fifth grade permanent. 4. Mr. R. Rama Ayyar from Sixth grade S. P. T. to Sixth grade permanent. 5. Mr. P. Gopalakrishna Rao from Seventh grade permanent to Sixth grade S. P. T. 6. Mr. S. Varadarajulu Reddi from Seventh grade S. P. T. to Seventh grade permanent. 7. Mr. Abdul Razack from Seventh grade temporary to Senyenth grade S. P. T. 8. Mr. D. V. Nagaratnam, Forester First grade to Ranger Seventh grade temporary.

III.

With effect from the 4th November 1934 viee Ranger V. P. Narayana Menon, III Grade invalided :

1. Mr. D. Ramakrishnyya from Fourth grade permanent to Third grade permanent. 2. Mr. K. K. Appayya, from Fifth grade permanent to Fourth grade permanent. 3. Mr. P. Gopalakrishna Rao, from Sixth grade S. P. T. to Sixth grade permanent. 4. Mr. K. Puvappa from Seventh grade permanent to Sixth grade S. P. T. 5. Mr. Abdul Razack from Seventh grade S. P. T. to Seventh grade permanent, 6. Mr. K. Subbaraya Ayyar from Seventh grade temporary to Seventh grade S. P. T. 7. Mr. B. Venkata Rao, Forester First grade, to Ranger Seventh grade temporary.

IV.

With effect from the 1st December 1934, vice Ranger P. S. Vardakrishnamachari, III Grade retired from service.

1. Mr. V, Narayanaswami Ayyar from Fourth grade permanent to Third grade permanent. 2. Mr. B. S. Ramaswami Ayyar from Fifth Grade permanent to Fourth grade permanent. 3, Mr. K. Puvappa from Sixth Grade S. P. T. to Sixth grade permanent. 4. Mr. A. Niladri Rao from Seventh grade permanent to Sixth grade S. P. T, 5. Mr. K. Subbaraya Ayyar from Seventh grade S. P. T. to Seventh grade permanent. 6. Mr. Y. Anjaneyulu from Seventh grade temporary to Seventh grade S. P. T, 7. Mr. V, Rangaehari, Forester First grade, to Ranger Seventh grade temporary.

V.

With effect from the 25th January 1935, vice Ranger I. John VII Grade, restored to the VI Grade.

1. Mr, Y. Anjaneyulu from seventh Grade S. P. T. to seventh grade permanent. 2. Mr. P. Krishnan temporary Ranger on Rs. 75 to new fifth grade of Rangers S. P. T. in the time scale of pay. 3. Mr, S. Rangamannar Doss, Forester first grade to Ranger seventh grade temporary.

Waltair Circle.

20-2-35. Mr. N. Chakrapani Ayyangar, further extension of leave for 20 months from 29-3-1935 to 21-11-1236, in continuation of the leave already given.

27-3-35. Mr. B. V. Nagarajan, on special duty, Guntur, will be considered to have been attached to Guntur from 6-3-1935 to 16-3-1935.

14-4-35. Mr. D. E. Lewin, on return from leave will be attached to Nellore on *special* duty. 2. This office S. O. posting him to Balliguda is cancelled.

29-1-36, Mr. Ch. Ramamurthi, transferred to Vizagapatam District, to charge of Gudem Range. 2. As the transfer was at the request of the Ranger it will carry no travelling allowance.

10-2-35. Mr. B. V. Nagarajan, on special duty, Guntur, posted to Udayagiri Range, Nellore Division. 2. Mr. D. E. Lewin, on return from leave posted to Balliguda Agency Range in relief of Mr. A, S. Kaunds. 3. Mr. A. S. Kaunds, (M. R. H.) Forester second grade on relief by item No. 2 transferred to Guntur and will be on special duty for the preparation of maps for Repalle mangrove Working Plan.

17-2-35. Mr. Madappa, (M.R.H.) Forester second grade, on special duty, Guntur District posted to Repalle Range in Relief of Mr. P. Venkatramani, M.A., I.F.S., Assistant Conservator of Forests, posted to Godavari Upper Division.

22-4-35. The leave for 2 months from 19-1-35 granted to Mr. M. A. H. Kirmani Sahib, extended by four months.

Bellary Circle.

3-5-35. Mr. K. Purushothama Rao, Anantapur Division granted extension of leave for two months from 21-4-35 in continuation of the leave already granted.

7-1-35. The following transfers are ordered in connection with hay operations for famine relief :—

1. Mr. G. V. Subba Rao, Sirvel Range to special duty Hospet Range with Head-quarters at Kanvihalli. To join expeditiously. 2. Mr. T. M. Krishnamacharlu, on special duty in Kurnool South Division the Sirvel Range of the same division in relief of item No. 1. To relieve No. 1 expeditiously.

29-1-35. Mr. S. M. Krishnaswami Iyer Kadiri Range Anantapur division granted leave for two months from the date of relief.

29-1-32. Mr. C. R. Rajagopalan, Kurnool West division granted extension of leave for four months from 7-1-35.

18-1-35. Mr. S. M. Krishnaswami Iyer, Kadiri Range, Anantapur division transferred to Vempalli Range, Cuddapah North division to relieve Mr. D. N. Subrahmanya Iyer, Sidhout Range who is in additional charge at present. 2. Mr. B. Krishna Rao, Sivapuram Range Kurnool West, transferred to Kadiri Range Anantapur division on relief by No. 3. 3. Mr. B. Venkatarangam Naidu, Forester First grade, Kurnool West division posted to Sivapuram Range.

17-3-35. Mr. Krishnaswami Iyer, Ranger Third grade, Anantapur division on expiry of his leave on 27-3-35 posted to Rajampet Range, Cudapah South division. 2. Mr. G. Devanayagam Naidu on relief by No. 1 posted to Ganjivaripalle Range, Kurnool East division. 3. Mr. B. Gulab Singh on relief by No. 2 granted leave for three months.

1-4-35. Mr. Y. Peddalakshimiah Naidu, Cuddapah North division posted to Badvel Range in the same division. 2. Mr. A. Seetharama Ayyah, Badvel Range, on relief by No. 1 transferred to Bukkapatnam Range, Ananthapur division. 3. Mr. T. Venkatasubbiah, Bukkapatnam Range, Anantapur Range on relief by No. 2 granted leave for two months.

6-4-35. Mr. H. P. Phillip, to Vempalle Range, Cuddapah, North division in relief of Mr. D. N. Subramanya Iyer Sidhout, now in additional charge. 2. Mr. P. Kannan, to Sivapuram Range Kurnool West division. 3. Mr. P. Venkatarangam Naidu, Sivapuram Range, on relief by No. 2 trausferred to Sirvel Range, Kurnool South division in relief of Mr. P. V. Krishna Rao Naidu Range Officer, Chelama now in additional charge.

9-4-35. Mr. Purushothama Rao, granted leave for two months in continuation of the leave granted.

10-4-35. Mr. B. T. Seetarama Iyer, Kurnool West division on expiry of his leave on 23-4-35 posted to Vonipenta Range, Cuddapah North division. 2. Mr. A. Vyasulu, Vonipenta Range, Cuddapah North division granted leave for one month from 23-4-35.

3-5-35. Mr. B. Krishna Rao, Kadiri Range, Anantapur division granted leave for two months from 30-4-1935 or date of relief. 2. Mr. C R. Rajagopalan on return from leave on 7-5-35 posted to Kadiri Range vice No. 1.

3-5-35. Mr. G. V. Subba Rao, posted back to Kurnool South after the completion of his present special duty. 2. The posting of Forester P. Venkatarangam Naidu, Kurnool West division to Sirvel Range is cancelled. He will revert to his permanent place as Forester in Kurnool West of Sivapuram Range Charge.

Working Plans Circle.

2-4-35. Mr. V. N. Parthasarathy Naidu, Ranger seventh grade, Working Plans Division, No. II (Cuddapah) Rayacheti granted leave for one month from date of relief. He will report himself for duty at Cherla, (No. V. Dn. Upper Godavari) before the working Plans Officer, Upper Godavari or the expiry of his leave.

Salem Circle,

9-1-35. 1. Mr. P. Shanmugasundaram Pillai, on return from leave on 7-2-1935, posted to Chandragiri Range, Chittoor division. 2. On relief by No. (i) Mr. T. S. Sankaranarayana Ayyar, posted to Gudiyattam Range, Chittoor division, Vice Mr. S. Ramalinga Ayyar, Ranger seventh grade, proceeding on leave.

9-1-35. Mr. B. V. Vaideeswara Ayyar, Tirupattur Range, Vellore west division, granted leave for one month on relief by Ranger Mr. H. E. Mac Bride, posted to Tirupattur Range.

22-2-35. Mr. P. A. Krishnaswami Mudaliar, on return from leave on 1-3-1935, posted to Atur Range, Salem South division, vice Mr. S. M. Srinivasagam Pillai, Ranger fourth grade, proceeding on leave.

22-2-35. Mr. S. M. Srinivasagam Pillai, Atur Range, Salem South division, granted leave for four months from date of relief.

16-2-35. C. B. Pemmiah, Trained Forester, second grade, Vellore west division, appointed to act as Ranger seventh grade and posted to Rasipur Range, Salem South division, *Vice* Mr. T. K. Parthasarathi Ayyangar, Ranger Sixth grade, on leave.

27-2-35. 1. Mr. S. V. Vaideeswara Ayyar, on return from leave on 3-3-35, posted to Chandragiri Range. Chittoor division. 2. On

relief by No. (i), Mr. T. S. Sankaranarayana Ayyar, posted to Gudiyattam Range, Chittoor division, vice Mr. S. Ramalinga Ayyar, granted leave.

14–3–35. Mr. Kalappa, Trained Forester First grade will continue to act as Ranger Seventh grade from 3–3–35, *Vice* Mr. S. M. Sreenivasagam Pillai, Ranger fourth grade on leave.

2–4–35. Mr. C. S. Pemmiah, will continue to act as Ranger Seventh grade. *Vice* Ranger T. K. Parthasarathi Ayyangar granted extension of leave for 6 months from 16–3–1935.

2–4–35. Mr. T. K. Parthasarathi Ayyangar, granted extension of leave for six months from 16–3–1935.

3–5–35. Mr. K. R. Subramaniam, Polur range, Vellore East division will be in additional charge of Tiruvannamalai Range, relieving Mr. R. Manickam Pillai, granted leave for one month. He should take charge from the latter before the end of 1st week of May 1935.

4–4–35. Marcel D'Souza, Trained Forester Second grade, Salem Central division, on return from leave on 13–5–1935, appointed to act as Ranger, last grade, and posted fo Tiruvannamalai Range, Vellore East division, *vice* Ranger R. Manickam Pillai, granted leave. The pay of the Acting Ranger will be regulated with reference to the rules in G. O. No. 311 (Public-Services) dated 14–4–1935.

Coimbatore Circle.

6–2–35. R. Rama Ayyar, Kollegal Range, granted leave for one month from 9–4–35 or date of relief.

19–3–35. T. Kondothu Goundar Ranger Fifth grade, Ramapuram Range, Kollegal division granted leave for four months from 1–5–1935 or date of relief.

22–3–35. Mr. R. Rama Ayyar, Kollegal division granted extension of leave for one month in continuation of the leave for one month granted to him.

28–3–35. Mr. C. Thiruvenkadam Pillai, on return from leave posted as Assistant Ranger, Tunacadavu Range. He should report himself for duty before the Range Officer, Tunacadavu at Top-slip on the forenoon of 30–3–35 without fail.

28–4–35. Mr. C. K. Unni. granted leave for one month and 8 days with effect from 25–3–35.

13–3–35. Mr. V. Maragathavelu, posted to Palni Range and to act as Ranger Seventh grade from the date of taking over charge. To join immediately. 2. On relief by No. 1 Mr. I. John, Palni Range, posted to Satyamangalam Range, in relief of Ranger C. S. Ramanathan, placed under suspension. To join forthwith.

15-3-35. Mr. C. S. Ramanathan, Ranger, Third grade, Satyamangalam Range, granted leave on average pay at Rs. 175 per mensem on medical certificate for a period of 15 days with effect from 19-2-35 forenoon to 5-3-35, afternoon.

6-2-35. Mr. P. Ramaswami Iyer, on return from medical leave to Bhavani Range in Coimbatore North division. 2. Mr. K. O. Anandan, Bhavani Range on relief by No. 1 posted to Ulandi Range in relief of Ranger Mr. C. R. Ragunathan proceeding on one month's leave. 3. Mr. C. R. Raghunathan on return from one month's leave posted to Kodaikanal Range in Madura Division. 4. Mr. R. Alagiriswami Naidu, on relief by No. 3 posted to Nanguneri Range Tinnevelly division. 5. The posting of Ranger P. Ramaswami Iyer for special duty in Coimbatore North is cancelled.

2-4-35. Mr. C. Thiruvengadam Pillai, Assistant Ranger Tunacadavu Range, transferred to Palni Range, Madura division. 2. Mr. A. M. Sreenivasan, on expiry of his leave posted to Kollegal division. He will remain attached to Ramapuram Range until 1-5-35 when he will take charge of the Range and relieve Ranger Kondathu Goundar granted leave.

10-4-35. Mr. P. A. Venkataraman, Pollachi Range transferred to Punachi Range. He should hand over charge to Ranger in charge of Pollachi depot, Mr. P. Doraiswami Ayyar on the 3rd April 1935 and relieve Mr. U. Vridachalam Pillai on or before 10-4-1935. 2. Mr. U. Vridachalam Pillai on relief by No. 1 transferred to Pollachi Range. He should take charge from Mr. P. Doraiswami Ayyar on or before the 17th April 1935.

16-4-35. The posting of Forester V. Maragathavelu to Palni Range is cancelled. 2. Mr. A. Culas Ayyalur Range, posted to hold additional charge of Palni Range—Vice Ranger I. John posted to Satyamangalam Range until relieved by Ranger C. Thiruengadam Pillai.

22-4-35. Mr. S. Nagalingam Pillai, sandalwood depot at Satyamangalam, granted leave for three months from 1-5-35 or date of relief. 2. Mr. A. Sitarama Sarma, Talamalai Range, will relieve Ranger S. Nagalingam Pillai *at once* and hold charge of the sandalwood depot at Satyamangalam in addition to his own duty until relieved by Ranger R. Rama Ayyar. 3. On expiry of his leave Mr. R. Rama Ayyar, posted to the sandalwood depot at Satyamangalam, in relief of Ranger A. Sitarama Sarma.

Ootacamund Circle.

7-2-35. Mr. Thomas Thachil, on expiry of his leave, to Segur Range The Nilgiris Division.

7-2-35. Mr. A. Rama Hebber, Coondapur Range, granted leave for three months and nineteen days from date of relief. 2. Mr.

K. Shankaranarayana Rao, on expiry of his leave, posted to Coondapur Range, Mangalore North division, vice No. (i).

11–2–35. In modification of this office S. O. dated 19–I–1235, Mr. M. S. Subbiah, Acting Ranger, attached to Segur Range from 28th January 1935 afternoon to 31st January 1925 afternoon, and then to be in charge of the Segur Range, the Nilgiris division.

2–3–35. Thomas Thachil, posted to Nilambur division for special duty, vice Ranger A. N. Ponniah, granted leave from 1st April 1935 or date of reilef.

5–3–35, Mr. A. N. Ponniah, attached to Nilambur Division, granted leave for two months from 1st April 1935 or date of relief.

7–3–35. In modification of para 1 of this office S. O. 7th February 1935, Mr. A Rama Hebber, granted leave as follows:— (i) Leave on average pay without medical certificate for 3 months and 21 days from 22nd Febry. 1935 to 12th June 1935. (ii) Leave on half average pay wjthout medical eertificate for 5 months and 19 days from 13th June 1935 to 1st December 1935 inclusive (preparatory to retirement).

8–4–35. Mr. K. R. Krishnan Nair, Shankaranarayana Range, Mangalore North, granted leave for one month with effect from 24th April 1935, and he is also permitted to prefix the Easter Holidays from 18th April 1935 to 23rd April 1935 to his leave. 2. Mr. C. J. Muthanna, Trained Forester, Nilambur division, posted to Shankaranarayana Range, Mangalore North vice No. 1

26–4–35. Mr. Chaikku, Ranger, Wynaad Division, granted leave for three months from 5th March 1935. 2. Mr. A. Muhammed Akbar, posted to Sultan's Battery Range, (vice No. 1).

30–5–35. Mr. G. Vasu, Mannarghat Range granted leave for four months from date of reiief. 2. Mr. B, Coates, Assistant to the Ranger Officer, Segur, Wynaad Division. posted to Mannarghat Range, vice No. (1).

25–3–35. Mr. K. K. Appiah, Bolampatty Range, granted leave for four months from 1st April 1935 or date of relief. 2. Mr. B. Coates, Assistant to the Range Officer, Begur, Wynaad division, posted to Bolampatty Range, Palghat Division vice No, (1). 3, Mr. P, K. Sankara Menon, Trained Forester, Nilambur Division, posted to Begur Range, Wynaad Division (Vice No. 2).

30–3–35. Mr. T. P. Gounder, Uppinangady Range, Mangalore South posted to Bolampatty Range, vice Ranger K. K. Appaiah granted leave. 2. Mr. M. S. Subbiah, posted to Uppinangady Range, Mangalore South Division.

11–5–35. 1. Mr. K. R. Krishnan Nair, on expiry of his leave re-posted to Shankaranarayana Range, Mangalore North Division. 2. Mr. C. J. Muthanna, Trained Forester, on relief by No. (i) will revert to Nilambur Division. 3. Mr. K. Chaikku, on expiry

of his leave, re-posted to Sultan's Battery Range, Wynaad Division. 4. Mr. A. Mohammad Akbar, on relief by No. (iii) will revert as Assistant Ranger, Chedleth. 5. Mr. A. N. Ponnayya, on expiry of this leave re-posted Assistant Range Officer, Nilambur Range. 6. Mr. Thomas Thachil, will continue to be on special duty in Nilambur Division.

OF SPECIAL UTILITY TO OFFICERS IN FOREST SERVICE.

THE "GECO" HAMMERLESS GUN.

12-bore D.B., B.L. gun with Anson and Deeley action. Fluid steel barrels, top lever cross bolt triple grip action. 30" barrels, left choke and right improved cylinder. Flat automatic safety slide on neck. Half pistol grip. Weight 6¼ lbs

A thoroughly efficient weapon

Non ejector Rs. 130/net. Ejector Rs. 160/net.

"THE BARTON" PRISMATIC BINOCULAR.

A handy field glass of perfect optical qualities. Centre rack focussing, large field of vision, stereoscopic effect. Magnification 8 times. In serviceable leather sling carrying case.

Rs, 55/- Less 10%.

THE "RESTICK" SEAT STICKS,

Best British make, aluminium fittings, tested iron-bark shafts, pigskin covered handles, rubber pad ferules, detachable ground discs.

Screw Fittings Rs. 40/- Snap Fittings Rs. 43/-

Less 10 percent.

GLARE PROTECTORS.

Fitted with Crooks A. B. or B-2 lenses. In a variety of stylish shell covered frames.

Rs. 10/- with case.

Powered Lenses Extra.

BARTON, SON & CO., LTD.,

BANGALORE AND OOTACAMUND.

KUCKREJA Ltd.,

399, Variety Hall Road,

COIMBATORE.

THE PREMIER HOUSE FOR TENNIS AND CRICKET MATERIALS.

—(o)—

Happy Chance for Tennis :

_ _ _ **Tennis Racket Regutting.**

PLAYERS !, Do not let your racket be spoilt by a marker. Let our expert handle it. All rackets will be re-polished, and re-shaped at our Coimbatore Branch. *Charges Moderate.*

FOR HOCKEY

Use our Goodshot and Willcox most reliable sticks ever produced.

FOR BADMINTON

Use our **V. R. S.** Special.

The Never-failing Companion of Dr. Subba Rao.